

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A cathode composition for a lithium-ion battery having the formula $\text{Li}[\text{M}^1_{(1-x)}\text{Mn}_x]\text{O}_2$ where (a) $[[0]] \ 0.083 < x < 0.5$ or (b) $0.5 < x < 1$, and M^1 represents one or more metal elements, with the proviso that (i) M^1 includes nickel, (ii) M^1 is a metal element other than chromium, and (iii) when M^1 includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said composition characterized as being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 full charge-discharge cycles at 30°C and a final capacity of 130 mAh/g using a discharge current of 30 mA/g.

2. (currently amended) A cathode composition according to claim 1 wherein M^1 [[is]] further includes an element selected from the group consisting of $[[\text{Ni}]]\text{Co}$, Fe, Cu, Li, Zn, V, and combinations thereof.

3. (currently amended) A cathode composition according to claim 1 wherein $x = (2-y)/3$ and $\text{M}^1_{(1-x)}$ has the formula $\text{Li}_{(1-2y)/3}\text{M}^2_y$, where $[[0]] \ 0.083 < y < 0.5$ and M^2 represents one or more metal elements, with the proviso that (i) M^2 includes nickel, (ii) M^2 is a metal element other than chromium, and (iii) when M^2 includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition having the formula $\text{Li}[\text{Li}_{(1-2y)/3}\text{M}^2_y\text{Mn}_{(2-y)/3}]\text{O}_2$.

4. (cancelled)

5. (original) A cathode composition according to claim 3 wherein $0.167 < y < 0.5$.

6. (original) A cathode composition according to claim 3 wherein M^2 is a single metal element.

7. (cancelled)

8. (currently amended) A cathode composition according to claim 1 wherein $x = (2-2y)/3$ and $M^{1-(1-x)}$ has the formula $Li_{(1-y)/3}M^3_y$, where $[[0]]$ $0.083 < y < 0.5$ and M^3 represents one or more metal elements, with the proviso that (i) M^3 includes nickel, (ii) M^3 is a metal element other than chromium, and (iii) when M^3 includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition having the formula $Li[Li_{(1-y)/3}M^3_yMn_{(2-2y)/3}]O_2$.

9. (cancelled)

10. (original) A cathode composition according to claim 8 wherein $0.167 < y < 0.5$.

11. (original) A cathode composition according to claim 8 wherein M^3 is a single metal element.

12. (cancelled)

13. (currently amended) A cathode composition according to claim 1 wherein $x = y$ and $M^{1-(1-x)}$ has the formula $M^4_yM^5_{1-2y}$, where $[[0]]$ $0.083 < y < 0.5$, with the proviso that (i) M^4 is a metal element other than chromium, $[[and]]$ (ii) M^5 is a metal element other than chromium that is different from M^4 , $[[and]]$ (iii) M^4 or M^5 includes nickel, and (iv) when M^4 , M^5 , or both includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition-having the formula $Li[M^4_yM^5_{1-2y}Mn_y]O_2$.

14. (cancelled)

15. (original) A cathode composition according to claim 13 wherein $0.167 < y < 0.5$.

16. (original) A cathode composition according to claim 13 wherein M^4 is Ni.

17. (original) A cathode composition according to claim 13 wherein M^5 is Co.

18. (original) A cathode composition according to claim 13 wherein M^4 is Ni and M^5 is Co.

19. (original) A lithium-ion battery comprising:

- (a) an anode;
- (b) a cathode according to claims 1, 3, 8, or 13; and
- (c) an electrolyte separating said anode and said cathode.